REMARKS

Claims 1-19 are pending. Claims 1-19 are rejected. Claims 1, 2 and 10 are amended.

This Response is filed in reply to the Final Office Action dated June 23, 2004. Applicant's silence with regard to any of the Examiner's rejections should not be construed as acquiescence to any of the rejections. The amendments to the claims are being made solely to expedite the prosecution of the above-identified application. Applicant reserves the option to further prosecute the same or similar claims in the instant or subsequent patent applications. Upon entry of the Amendment, claims 1-19 are pending in the present application.

Figures 1-3 of the drawings were objected to in that they should be designated by a legend such as "Prior Art". Figure 6 was objected to in that reference [60] was missing. Replacement drawings sheets 1/3 and 2/3 are attached hereto, with the legend "(PRIOR ART)" provided and the reference 60 included.

The Examiner objected to the specification because of informalities. The specification was amended to refer to Figure 3 as a "generalized looping statement", and to correct the reference numeral [60] in referring to Figure 3.

Claims 1-8 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. Applicant notes that it is inherent that processing a looping statement is executed in a computer system and accordingly traverses the rejection. However, in order to move prosecution forward, claim 1 is amended to recite a method "executed in a computer system". Support for the amendment is found at page 8, line 26 through page 9, line 8 of the specification, at the least.

Claim 2 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

Applicant regards as the invention. Claims 2 and 10 are amended to recite "an initial condition" and "an exit condition".

Claims 1, 3-5, 9, 11-13, 17 and 19-5, 8-15 and 18-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Biggerstaff (U.S. Patent No. 6,745,384). Claims 2, 6-8, 10, 14-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Biggerstaff in view of Official Notice (claims 2, 6-8, 10 and 14-16), and further in view of Goebel (U.S. Patent No. 6,009,272). Applicant traverses the rejections under 35 U.S.C. 102(e) and 35 U.S.C. 103(a).

Biggerstaff describes a method and system for anticipatory optimization of computer programs. The system generates code for a program that is specified using programming-language-defined computational constructs and user-defined, domain-specific computational constructs. The computational constructs include high-level operands that are domain-specific composites of low-level computational constructs. The system generates an abstract syntax tree (AST) representation of the program in a loop merging process. The AST has nodes representing the computational constructs of the program and abstract optimization tags for folding of the composites. A composite folding process is applied to the AST according to the optimization tags to generate optimized code for the program. The composite folding process includes identifying an optimization event, identifying each abstract optimization tag applied to the programming-language-defined computational constructs and having a transformation condition identifying the optimization event as a condition for attempting an anticipated optimization in the translation, and attempting execution of each of the anticipated optimization transformations associated with the optimization event.

Applicant's claim 1 recites a method executed in a computer system for processing a variable looping statement to enable loop unrolling. The method includes determining an upper bound and a lower bound for a loop index within the variable looping statement and determining a condition that must be satisfied. The condition can reflect any conditions within an initial expression and an exit expression of the variable looping statement. The method also includes forming a constant looping statement, wherein the upper bound and the lower bound define a range of values for a loop index within the constant looping statement, wherein the constant looping statement includes a nested conditional statement which tests the determined condition, wherein a body of the constant looping statement comprises a body of the variable looping statement, and wherein the body of the constant looping statement is only executed in the event that the determined condition is satisfied.

The Examiner contends that Fig. 33 discloses the elements of Applicant's claim 1. However, in rejecting claim 1, the Examiner fails to provide any citations to the specification. On its own, Fig. 33 merely shows a nested for loop statement (Fig. 33, lines 1 and 2) including a conditional statement (Fig. 33, line 3). Fig. 33 does not illustrate a process or method. Applicant's claim 1 is directed to a method that processes a variable loop statement to enable loop unrolling. Merely describing a statement that includes upper and lower bounds, a condition that is to be satisfied, or a nested conditional statement does not disclose the method of claim 1. Fig. 33 does not show any step, action, and/or part of a method that includes *determining* an upper bound and a lower bound; does not show *determining* a condition that must be satisfied; and/or does not show *forming* a constant looping statement, all as recited in Applicant's claim 1.

Further, the statement shown in Fig. 33 appears to be consistent with Applicant's definition of a constant looping statement. Thus, Fig. 33, line 1 does not show a variable looping statement from which the upper and lower bounds for a loop index can be determined. It follows that, without showing a variable looping statement, Fig. 33, line 3 does not show conditions within an initial expression and an exit expression of a variable looping statement. Also, without showing a variable looping statement, Fig. 33, lines 1-4, does not show a body of a variable looping statement. Based on the above, claim 1 is allowable and reconsideration of the rejection of claim 1 is respectfully requested. Independent claims 9 and 17-19 recite limitations directed to processing variable looping statements. For the reasons described with respect to claim 1, claims 9 and 17-19 are allowable and reconsideration of the rejection of claims 9 and 17-19 is respectfully requested. Claims 2-8 and 10-16 depend respectively from claims 1 and 9 and are allowable at least by dependency.

With respect to claim 2, the Examiner recognized that Biggerstaff does not disclose forming a logical "AND". However, the Examiner contends that Biggerstaff discloses that determining a condition comprises forming a logical "OR" of the initial condition and the exit condition and that it would have been obvious to form a conditional statement using the logical "AND" operator and that using the logical "AND" operator is an obvious variation. Applicant respectfully disagrees. The Examiner has provided no citation to Biggerstaff to show that Biggerstaff discloses forming a logical "OR". While the use of logical "AND" operators or logical "OR" operators is common in computer programming, *forming a logical "AND" of an initial condition within an initial expression of a variable looping statement and an exit condition within an exit expression of the variable looping statement* is not taught or suggested in Biggerstaff, or in any of the cited prior art.

The Examiner has taken Official Notice that it would have been obvious to form a conditional statement using the logical "AND" operator. As stated above, the use of logical "AND" operators or logical "OR" operators is common in computer programming. However, Applicant specifically recites that the logical "AND" is formed of *an initial condition within an initial expression of a variable looping statement and an exit condition within an exit expression of the variable looping statement.* The prior art does not teach or suggest Applicant's method of forming a logical "AND", and the Official Notice taken by the Examiner does not correspond the limitations recited in Applicant's claim 2. Based on the above, claim 2 is allowable and reconsideration of the rejection of claim 2 is respectfully requested. Claim 10 recites a limitation similar to claim 2 and is allowable for the same reasons.

With respect to claims 3-8, the Examiner contends that Biggerstaff discloses determining whether said variable looping statement includes an increasing loop index value (col. 8, lines 38-50; Fig. 33). Applicant respectfully disagrees. In the citation provided by the Examiner, Biggerstaff describes the application of transforms to a sample statement $A = B + (2 * C)$, where A, B and C are matrices (col. 7, lines 33-40). Applicant submits that the sample statement does not correspond with Applicant's variable looping statement. It follows that the Examiner's citation does not teach or suggest *determining whether said variable looping statement includes an increasing loop index value*, as recited in Applicant's claim 3, or *determining whether said variable looping statement includes an decreasing loop index value*, as recited in Applicant's claim 6.

The citation itself does not disclose determining whether a loop index value is increasing or decreasing. Rather, Biggerstaff discloses applying a transform that replaces nodes on a tree representation of the above statement and adds an optimization tag to the replaced nodes. A replaced node contains a reference to an operand of iteration, which for each step of the iteration, takes on the value of each element of the corresponding matrix. The optimization tag indicates that nested "for" loops with separate index variables need to be used to access the elements of the matrix. Biggerstaff does not teach or suggest determining whether the index variables are increasing or decreasing. As discussed previously, Fig. 33 does not show any step, action, and/or part of a method.

It follows that since Biggerstaff does not teach or suggest determining whether the index variables are increasing or decreasing, Biggerstaff does not teach or suggest determining upper and lower bounds based on whether the index variables are increasing or decreasing, as recited in claims 4, 5, 7 and 8. Based on the above, claims 3-8 are allowable and reconsideration of the rejection of claims 3-8 is respectfully requested. Claims 11-16 recite limitations similar to claims 3-8 and are allowable for the same reasons.

CONCLUSION

On the basis of the foregoing Amendment and Remarks, this application is in condition for allowance. Accordingly, Applicant requests allowance.

Respectfully submitted,

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